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COMPANY

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA
SAN FRANCISCO DIVISION

UNITED STATES OF AMERICA,

Plaintiff,

v.

PACIFIC GAS AND ELECTRIC COMPANY,

Defendant.

Case No. 14-CR-00175-WHA

**RESPONSE TO ORDERS FOR
FURTHER RESPONSES RE DIXIE
FIRE**

Judge: Hon. William Alsup

Defendant Pacific Gas and Electric Company (“PG&E”) respectfully submits this response to the Court’s September 14, 2021 (Dkt. 1470) and September 20, 2021 (Dkt. 1477) orders requesting information regarding the Dixie Fire.

Question 1:

PG&E shall describe its policies, practices, and procedures then in place for the circumstances in which it would deenergize a line pending investigation of a fault. It shall also describe the extent to which the decision to do so rests with troublemen versus the dispatch operator versus others. PG&E shall identify, by name and position, all individuals with decision-making power and shall identify by name all specific individuals who actually gave consideration or input as to how to respond to this July 13 incident. For one example, did anyone specifically consider de-energizing any part (or all) of the Bucks Creek 1101 line and, if so, when and how?

PG&E Response:

The PG&E employees with primary responsibility for deciding whether to de-energize distribution lines are distribution operators. Distribution operators are trained to operate the electric distribution system to protect public safety and property, and are authorized to de-energize distribution lines if determined to be appropriate based on known facts and circumstances.¹ Pursuant to PG&E’s operating procedures, troublemen generally coordinate with distribution operators in the Control Center before taking actions to de-energize power lines.

Troublemen are authorized to act to de-energize power lines without first contacting the Control Center to protect life or property during emergencies or if single phasing is present.

With respect to emergencies, Section 1.2 of Utility Procedure TD-2700P-10 (Electric System Emergency Response Protocol) states that, “[i]n emergencies where communications are

¹ Utility Standard TD-2700S provides that “[t]he system operator’s first priority is safety” and “[s]ystem operators must be prepared to take prompt action to protect personnel, the public, and property.” Ex. LL-2 at 4. Utility Procedure TD-2700P-09, “Responding to Emergencies and Alarms,” sets forth steps that distribution operators take in responding to emergencies, including analyzing the situation by gathering and recording information and acting only after understanding the nature and extent of the emergency and considering specified issues including whether there is a hazard to people or property. Ex. LL-3.

1 interrupted AND it is necessary to protect lives or property, switchmen^[2] may TAKE appropriate
 2 action without first obtaining approval from the control center, except as covered by specific orders.”
 3 Ex. LL-4 at 1.

4 With respect to single phasing, Section 10.1 of Utility Procedure TD-2908P-01
 5 (Distribution Switching Procedures) states that switchmen are authorized to take steps to de-energize
 6 power lines without first contacting the Control Center if single phasing is present. If single phasing
 7 is present, for example where a single fuse has operated on a three-phase or three-wire circuit,
 8 PG&E’s operating procedures direct that the remaining fuses should be opened or other steps taken
 9 to mitigate the impact of this condition before performing a patrol. See Ex. LL-1 at 31.

10 The individuals described as NDCC Operators #1, #2 and #3 in Exhibit II to PG&E’s
 11 September 17, 2021 submission to the Court (Dkt. 1474-01) are distribution operators who had
 12 decision-making power to de-energize the Bucks Creek 1101 line at various times before 5:00 p.m.
 13 on July 13. The Dixie Troubleman also had such authority if the Dixie Troubleman had determined
 14 it was necessary to protect life or property or prevent single phasing (and, in fact, the Dixie
 15 Troubleman did de-energize the line at Fuse 17733 upon arrival at the fuse and upon observing the
 16 presence of a fire).

17 As set forth more fully in PG&E’s September 17, 2021 submission to the Court (Dkt.
 18 1474), PG&E is currently aware of one distribution operator, NDCC Operator #1, who recalls
 19 considering prior to 5:00 p.m. on July 13, 2021 whether the Bucks Creek 1101 line should be de-
 20 energized.

21 **Question 2:**

22 *As a single exhibit, provide all PG&E (and partner, contractor, etc.)*
 23 *internal emails, texts, memos, and other documents created on July 13 or*
 24

25
 26 ² The term “switchmen” as used in the policy is intended to refer to certain categories of
 27 employees, including troublemen and others, who are trained to perform switching operations in the
 28 field.

1 *14, 2021, pertaining to the July 13 incident on the Bucks Creek 1101 line,*
 2 *and separately summarize them.*

3 **PG&E Response:**

4 PG&E understands the Court's request for internal emails, texts, memos, and other
 5 documents "pertaining to the July 13 incident on the Bucks Creek 1101 line" to refer to such
 6 materials that relate either to the outage at the Cresta Dam reported the morning of July 13, 2021
 7 ("Cresta Dam Outage") or to the Dixie Fire.³ To respond to the Court's document request, PG&E is
 8 conducting a reasonable search for responsive documents on an expedited basis using the parameters
 9 set out below, but, in the time allotted by the Court, PG&E has not been able to complete the
 10 process. This collection involves collecting and reviewing documents from many different parts of
 11 the company and approximately 70 individual custodians, as well as completing approximately 27
 12 mobile collections, which requires physical collection and imaging of mobile devices from
 13 employees in the field. PG&E is working to produce and summarize the documents requested as
 14 soon as practicable. PG&E anticipates delivering to the Court next week a thumb drive containing
 15 electronic copies of an initial set of documents that PG&E has identified as responsive to this
 16 request, and will provide additional documents on a rolling basis thereafter, keeping the Court
 17 apprised of the status of the document production.⁴

18 a. PG&E has identified approximately 70 custodians ("Custodians") likely to have
 19 documents responsive to this question. The Custodians were identified as people on teams which
 20 were involved with responding to outages such as the Cresta Dam Outage and wildfire events such
 21 as the Dixie Fire: Hazard Awareness & Warning Center ("HAWC"); Public Safety Specialists
 22 ("PSS"); Emergency Operations Center ("EOC"); Safety & Infrastructure Protection ("SIPT");

23
 24 ³ PG&E does not interpret the Court's question as calling for information protected by the
 25 attorney-client privilege or attorney work product protection. Any privileged information in
 otherwise unprivileged documents will be redacted.

26 ⁴ In an effort to get these documents to the Court as quickly as possible, PG&E will produce to the
 27 Court copies of the documents that have not had personally identifying information and other
 28 confidential information redacted. Thereafter, PG&E will identify and redact such information and
 will prepare and deliver a redacted set and file a corresponding administrative motion to seal.

1 Northern Distribution Control Center (“Control Center”); Electric Dispatch; Rock Creek Switching
 2 Center; Grid Control Center (“GCC”); and Unmanned Aerial Systems (“UAS”). PG&E is also
 3 collecting Documents from troublemen and others who were in the field on July 13. PG&E is
 4 running the following search terms against the Custodians’ emails, Outlook calendar appointments,
 5 and One Drive documents (collectively, “Documents”) from July 13-14, 2021: (Buck* W/5 Creek)
 6 OR (Cresta) OR (fire) OR (17733) OR (941). Each of the Custodians’ Documents dated July 13 or
 7 July 14, 2021 that contains terms satisfying this search is being or will be reviewed and, if
 8 determined to be responsive to this request, will be produced to the Court.

9 PG&E has also collected for review and will produce to the Court non-custodial
 10 documents created on July 13 or 14, 2021 by the teams listed above that relate to the Cresta Dam
 11 Outage or the Dixie Fire.

12 b. PG&E has also identified a list of approximately 27 custodians likely to have
 13 texts, photographs, or other files on their mobile devices responsive to this question (“Mobile
 14 Custodians”). These people, all of whom are also included among the Custodians noted above in
 15 (a), were involved in responding to the Cresta Dam Outage and Dixie Fire in the Feather River
 16 Canyon on July 13 or 14. They include troublemen and roving hydro operators involved in
 17 investigating the Cresta Dam Outage and their supervisors, members of the PSS and SIPT teams
 18 who were involved in PG&E’s response to the fire, and a dispatcher in PG&E’s UAS group. PG&E
 19 is collecting files from the Mobile Custodians’ mobile devices; each of the Mobile Custodians’ files
 20 dated July 13 or July 14, 2021 is being reviewed and, if determined to be responsive to this request,
 21 will be produced to the Court.

22 **Question 3:**

23 *PG&E shall submit all documents (including electronically-stored*
 24 *documents) within PG&E’s possession or control that summarize,*
 25 *describe, or refer to any PG&E policies, procedures, or protocols that*
 26 *address how PG&E should respond to tags with the following*
 27 *characteristics: (1) in HFTDs; (2) with a fault on the line or an outage*
 28 *without a fault; and (3) where that outage plausibly could be the result of*

1 *a fallen/leaning tree or branch contacting the line. Provide the documents*
2 *as a single exhibit but also summarize them in your response.*

3 **PG&E Response:**

4 Tags are assigned to electric distribution troublemen as priority 0, priority 1, or
5 priority 2. Attachment 1 to PG&E's UO Customer Service Policy (Standard List of Field Services
6 Offered) describes the situations and associated response times for each of the three priority levels.
7 *See Ex. LL-5 at 3.6-6 through 3.6-8.*⁵

8 A "timely emergency response" is a priority 0, requiring an immediate response.
9 Priority 0 tags are for immediate safety issues such as fire, arcing/bare wires, wire down, car/power
10 pole contact, and other situations requiring immediate response.

11 A "same day response" is a priority 1. This is for nonemergency services such as
12 restoring service that has been shut off in error or an electric outage.

13 A "scheduled response" is a priority 2, requiring response on a scheduled basis on a
14 future day. This includes ongoing voltage complaints, setting electric meters, and discontinuing
15 electric service.

16 The person creating a tag chooses a job code associated with the issue necessitating
17 the tag. PG&E's system then automatically populates the priority level based on the chosen job
18 code.

19 The tag for the Cresta Dam Outage was a priority 1 tag. As of July 13, 2021, there
20 were not different procedures for assigning tags with the specific characteristics described by the
21 Court. If PG&E dispatchers, distribution operators or troublemen become aware, after a tag is
22 assigned, of an emergency or a safety hazard associated with that tag, they are authorized to take
23 appropriate steps to address the emergency or safety hazard as described in response to Question 1
24 above, or increase the priority of the tag.

25
26
27 ⁵ Exhibit LL also contains the procedures referenced in Question 1.

Following the ignition of the Dixie Fire, as described in PG&E's September 17, 2021 submission to the Court (Dkt. 1474), PG&E has been targeting for PG&E personnel to respond safely to outages in Tier 2 and Tier 3 High Fire Threat Districts ("HFTDs") within a goal of 60 minutes in order to identify and mitigate public safety hazards that may exist beyond the reported outage, and also allow for quicker notification and more efficient resource allocation from public agencies. PG&E is continuing to evaluate potential additional mitigations to facilitate improving response rates to attempt to meet this goal.

Question 4:

In the actual event, when switch 941 was turned off on July 13, how did the railroad deal with that loss of power? Why couldn't the same approach have been taken if the switch had been turned off earlier in the day? Did the railroad have backup power at that location? How does the railroad generally deal with PSPS de-energizations?

PG&E Response:

In order to obtain accurate information for the Court, PG&E requested that the railroad provide PG&E with information responsive to this question. The railroad confirmed the following information:

In the ordinary course, the railroad's facility load-side of switch 941 operates on batteries that are consistently recharged by commercial power provided by PG&E and, in the event of a loss of commercial power to recharge the batteries, the batteries continue providing power for approximately 8 to 24 hours, depending on the power demand of the particular location and battery characteristics. After the railroad's control center received a signal from the facility at 2326 hours Central Time on July 13 that it had lost commercial power,⁶ the railroad's facility continued to operate normally on battery power. The recharging of the batteries resumed at 0941 hours Central

⁶ PG&E notes that while the railroad's control center received a signal from the facility at 2326 hours Central Time that it had lost commercial power, PG&E's records reflect that the Switch Troubleshooter opened switch 941 at 2030 hours Pacific Time, which is 2230 hours Central Time. See Ex. EE, Dkt. 1444-07; see also Ex. JJ-25, Dkt. 1474-26 (Switch Troubleshooter reports to NDCC Operator #2 that the switch was opened at 2030 hours).

Time on July 14 using power from a generator that the railroad had transported to the facility and installed after receiving the signal that the facility had lost commercial power on July 13. The railroad's use of battery power at locations like this facility is designed to provide continuing power in the event of the loss of commercial power at any time, including had the loss of commercial power occurred earlier in the day on July 13, and the railroad generally responds to losses of commercial power at locations like this facility by continuing to rely on battery power and, depending on the circumstances and the expected length of the outage, either waiting for commercial power to be restored or deploying a generator.

Question 5:

For each channel that was installed in the radio in the Troubleman's truck, state the location of the nearest repeater to the Bucks Creek 1101 line and its frequency pairs. If a channel was simplex (rather than duplex), state the single frequency for that channel as of July 13. What radio frequencies were installed and monitored on July 13 at the Rock Creek Switching Center?

PG&E Response:

PG&E uses a trunked radio system where users key in "talkgroup" numbers to make radio calls. A talkgroup is a group of radio users who are all simultaneously tuned to the same talkgroup number. A user wishing to communicate with a given talkgroup keys in that talkgroup's four digit code and then makes a call. If the caller's radio is in range of a repeater, the repeater picks up the call and routes it into PG&E's server-based radio network, which then routes it for broadcast to any repeater that is within range of a radio user who has also set his or her radio to that talkgroup. This system assigns channels automatically, which allows a large number of radio users to use a finite number of channels efficiently. A user of PG&E's trunked system typically would not know the channel or frequency that his or her radio is using to communicate with PG&E's repeaters, only the talkgroup number.

The three PG&E radio repeater sites nearest to the Dixie Fire's area of origin are depicted on the map attached hereto as Exhibit MM. The Flea Mountain and Red Hill sites each

have four repeaters; the Lower Bucks Lake site has three. The frequencies used by the repeaters at these sites are set forth in Table 1 below.

Table 1

<u>Site Name</u>	<u>Repeater No.</u>	<u>Transmit Frequency</u>	<u>Receive Frequency</u>
Flea Mountain	Repeater 1	452.07500	457.07500
	Repeater 2	454.13125	459.13125
	Repeater 3	452.72500	457.72500
	Repeater 4	452.25000	457.25000
Red Hill	Repeater 1	464.60000	469.60000
	Repeater 2	461.95000	466.95000
	Repeater 3	463.92500	468.92500
	Repeater 4	464.61250	469.61250
Lower Bucks Lake	Repeater 1	452.20000	457.20000
	Repeater 2	452.70000	457.70000
	Repeater 3	451.22500	456.22500

PG&E's radios also allow users to communicate via simplex or "radio to radio" channels. Simplex connections do not go through a repeater. To communicate via a simplex channel, both users must manually set their radios to the same simplex channel. A typical scenario in which simplex communication may be used is when there is a line of sight between two users, such as two users working on adjacent poles. PG&E maintains the simplex channels set forth in Appendix 1. PG&E radios cannot use the trunked system and a simplex channel at the same time.

The Rock Creek Switching Center is a hydro generation facility; its employees are not involved in electricity distribution. The radio at its facility, like the radios in PG&E's trucks, can be used to access any talkgroup. The Rock Creek Switching Center was monitoring a hydro talkgroup, 6511, on the afternoon of July 13.

* * *

PG&E has learned that in addition to the Dixie Troubleman's radio calls reporting the fire around 5:00 p.m. on July 13, another employee reported the fire at about 5:01 p.m. The

1 employee was driving down on Highway 70 and saw smoke from a fire from his vehicle as he
2 approached Cresta Dam; he reported the fire on his radio on talkgroup 6511; a Rock Creek operator
3 heard his report and responded that he would notify Cal Fire, which he did. PG&E believes it was
4 this call—not the Dixie Troubleman’s calls in the same time frame—that prompted the operator at
5 the Rock Creek Powerhouse to contact Cal Fire.

6 PG&E has also learned that, earlier in the afternoon of July 13, a Senior Power
7 Generation Inspector (“Inspector”), located at the Bucks Creek Powerhouse parking lot, thought he
8 smelled and saw smoke southeast of the powerhouse—i.e., not in the direction of the origin of the
9 Dixie Fire. The Bucks Creek Powerhouse is adjacent to the Bucks Creek Substation, approximately
10 3.7 miles up the canyon to the northeast of the Cresta Dam, as reflected in the map provided in
11 Exhibit X-2 (Dkt. 1428-24). The Inspector concluded that what he thought he had observed to be
12 smoke was only a cloud. He stopped smelling smoke about a half hour after he first smelled it.

13 The Inspector called the Rock Creek Switching Center (which is in the Rock Creek
14 Powerhouse, approximately one mile down the canyon toward Cresta Dam from the Bucks Creek
15 Powerhouse) and alerted the Operator there that he smelled smoke. The Operator alerted a
16 helicopter pilot and asked the pilot to fly over the Bucks Creek area. The Inspector reports having
17 seen a helicopter over the area shortly thereafter. PG&E is working to determine the identity of the
18 helicopter pilot and whether the helicopter flew over the area in response to the Operator’s call.

19 The Operator at the Rock Creek Switching Center also exited the facility and asked
20 an electrician working outside the facility whether he smelled smoke or any sign of fire. The
21 electrician circled the facility; he did not smell smoke or see any sign of fire.

22 The Operator and the Inspector recall the call concerning the smell of smoke
23 occurring after noon. Records show that the Operator formally signed into his shift at 226 p.m., and
24 GPS tracking data shows that the electrician left the Rock Creek Power House for the day at
25 approximately 316 p.m.

26 PG&E is searching for documents or calls relating to the Inspector’s report and the
27 follow up to it, and will produce any relevant records it locates promptly.

Question 6:

What cell phone carrier did the Troubleman use for his work-issued cell phone? How did the Troubleman receive work tags? Via his PG&E-issue cell phone, or a different device? What carrier did that device employ? Did the Troubleman have a personal cell phone with him? If so, what carrier did it use? Did he carry a satellite phone?

PG&E Response:

The carrier for the Dixie Troubleman's work-issued cell phone was Verizon. The Dixie Troubleman received work tags through his GeTAC device, which is similar to a laptop; his GeTAC device can connect to PG&E's network via Wi-Fi or Verizon's cellular network. The Dixie Troubleman also receives work tags through e-pages to his work-issued cell phone. The Dixie Troubleman had a personal cell phone with him on July 13, which also uses Verizon. The Dixie Troubleman did not have a satellite phone with him on July 13.

Question 7:

With respect to the Troubleman's testimony that the radio would not work (except at the single location he indicated on Highway 70) and that the radio call he received while fighting the fire came line of sight and on a single frequency from a truck also in the hills, PG&E shall submit corroboration of all aspects of this testimony and shall separately submit all documents in its possession or control that explain radio reception in the canyon.

PG&E Response:

With respect to the Troubleman's testimony regarding cell phone and radio reception in the area, PG&E attaches hereto as Exhibit MM a map generated by software called EDX that shows the approximate range of radio reception in the area of origin of the Dixie Fire based on equipment specifications. The green shaded areas on the map represent areas where estimated radio coverage is greater than -96 DBm (decibels in milliwatts), which is generally considered "good" signal receive strength on a mobile radio (i.e. what a mobile radio might hear from a repeater). The map does not denote real time conditions, and multiple factors can affect the ability of a truck radio to connect with a repeater, including: terrain; atmospheric conditions (including particulates, solar flares, rain, and snow); vegetation; smoke; and the condition of the radio equipment in the truck.

1 Moving just a few dozen feet can sometimes have a significant effect on radio connectivity. The
 2 green shading on the map does not cover the reported area of origin of the Dixie Fire.

3 PG&E will also submit two files containing data from two “drive studies” it
 4 conducted in 2012 of radio reception for two repeater sites, Red Hill and Lower Bucks Lake, that are
 5 typically able to contact the area around the Feather River Canyon. Data from the Lower Bucks
 6 Lake study indicates reported coverage of -101 DBm at a point on Highway 70 near Cresta Dam—a
 7 level considered poor radio coverage. PG&E produces these studies because they are responsive to
 8 the Court’s question, but notes that the studies are several years old and that numerous variable
 9 factors that can affect radio reception at any given time.

10 The Troubleman also testified that he “assum[ed]” his radio communication with a
 11 supervisor reporting the fire “went from truck to truck.” Sept. 13, 2021 Hr’g Tr. at 70:11-71:7.
 12 Radio calls are not recorded unless they reach a repeater and enter PG&E’s trunked system.
 13 Simplex “radio to radio” calls are not recorded because they do not use PG&E’s repeaters. The
 14 Troubleman’s calls that PG&E has retrieved between 4:55 p.m. and 5:16 p.m. were recorded (*see*
 15 Exhibit JJ-14, Dkt. 1474-15), and therefore PG&E understands that these calls would have reached
 16 PG&E’s repeaters via the trunked radio system.

17 **Question 8:**

18 *Submit a declaration of the employee with whom the Troubleman talked*
 19 *by radio from the pole site on July 13. The declaration should state*
 20 *whether the employee was using simplex (i.e. no repeater) versus a*
 21 *repeater in communicating with the Troubleman, and his location at the*
 22 *time and the channel used.*

23 **PG&E Response:**

24 A declaration from Supervisor #1, with whom the Dixie Troubleman spoke by radio
 25 from the pole site on July 13, is attached as Exhibit NN. Supervisor #1 was in Chico, California,
 26 when he first heard the Troubleman’s attempt to establish radio contact. Supervisor #1 believes he
 27 was on talkgroup 6741, which is not a simplex channel.
 28

Question 9:

What was the Fire Index on July 13 for the location of Fuse 17733?

PG&E Response:

PG&E typically circulates each day a Utility Fire Potential Index (“FPI”) Forecast for that day and the following two days that uses a rating system to assess the risk of fire and its likely behavior by assigning a value to each Fire Index Area in PG&E’s service territory based on forecast weather conditions and historical fire occurrences. The system’s scale runs from R1 (lowest) to R5 (highest). A Fire Index Area may also be designated as R5-Plus, which is used to denote the greatest level of fire danger where rapidly moving, catastrophic wildfires are possible and this typically occurs when fire danger is extreme combined with a high-risk weather triggers (e.g., strong winds). The July 13 Fire Index Rating circulated on July 11, July 12 and July 13 for the Fire Index Area encompassing Fuse 17733 was R4, which is used when the fire danger is critical and using equipment and open flames is limited to specific areas and times. PG&E provides as Exhibit OO a map showing the Utility FPI Ratings in PG&E’s service territory for July 13, 2021 circulated on July 13, and the Fire Index Area encompassing Fuse 17733 is 248.

PG&E notes that, in the process by which it forecasts each Fire Index Area’s Utility FPI Rating for a given day, PG&E first ascribes a “fire_danger_rating” to each grid cell in PG&E’s service territory from R1 (lowest) to R5 (highest). The maximum of a given grid cell’s fire_danger_ratings for a day is then averaged with the same for all other grid cells in a given Fire Index Area to forecast that Fire Index Area’s Utility FPI Rating. While the Fire Index Area encompassing Fuse 17733’s Utility FPI Rating for July 13 was, as noted above, R4, PG&E notes for the Court that the grid cell encompassing Fuse 17733 had a maximum forecast fire_danger_rating of R5 for several hours on July 13, although that value, by itself, is not reported nor does it inform decision-making.

Question 10:

The Court is informed that there were no lightning strikes in the area for at least seven days prior to July 13. Please research and provide PG&E’s view on this matter.

PG&E Response:

The lightning strike data in PG&E's possession from PG&E's Lightning Detection Network is consistent with the Court's information that there were no lightning strikes within the North Valley Division for the seven days prior to and including July 13.

Question 11:

Is PG&E in possession of any information from any source that the Dixie Fire was (or was not) ignited by lightning? If so, state all such information in summary form and separately provide the back up documentation

PG&E Response:

As noted in PG&E's response to question 10, PG&E's records do not reflect that there were any lightning strikes on July 13, 2021 within the North Valley Division, which encompasses the area where the Dixie Troubleman reported first observing the fire.

Question 12:

PG&E's 2021 Wildfire Mitigation Plan Revised (dated June 3, 2021) states at page 621 under the heading "Risk to be mitigated/problem to be solved":

A high impedance fault like a wire down or tree contact could remain undetected and become an ignition source. In addition, high impedance line to ground faults on distribution circuits are difficult to detect with traditional overcurrent protection.

Explain why and how a "tree contact could remain undetected and become an ignition source." Separately, as a single exhibit, attach all PG&E documents necessary to explain this problem. With respect to high impedance ground faults, to what extent were PG&E's sensors for the Bucks Creek 1101 Circuit set (or not set) to detect such levels of current? Put differently, if a single phase was sending power to ground through the tree in question, was the PG&E equipment then set to detect such an occurrence?

PG&E Response:

Explain why and how a "tree contact could remain undetected and become an ignition source." Separately, as a single exhibit, attach all PG&E documents necessary to explain this problem.

1 A high impedance fault can result when an energized primary conductor falls to the
 2 ground or comes in contact with a quasi-insulating object such as a tree, structure, or equipment. In
 3 that circumstance, the line to ground fault does not draw a full fault current and therefore may not be
 4 detected by a protective device even as the current continues to flow to the ground from the downed
 5 conductor or through the object. Vegetation generally has high impedance to the flow of current.
 6 As discussed in PG&E's 2021 Wildfire Mitigation Plan, PG&E has undertaken several initiatives to
 7 address high impedance faults, including the installation of new recloser controllers that enable
 8 protective features designed to address high impedance ground fault conditions, including Sensitive
 9 Ground Fault, as well as the Rapid Earth Fault Current Limiter pilot project. PG&E's Fast Trip
 10 Mitigation program discussed in PG&E's September 17, 2021 submission also is designed in part to
 11 address high impedance ground fault conditions. PG&E has not located any documents specifically
 12 explaining the problem of a tree contact remaining undetected and becoming an ignition source, but
 13 PG&E notes that high-impedance faults are discussed in other documents, including in other sections
 14 of the Revised 2021 WMP.

15 *With respect to high impedance ground faults, to what extent were*
 16 *PG&E's sensors for the Bucks Creek 1101 Circuit set (or not set) to detect*
 17 *such levels of current? Put differently, if a single phase was sending*
 18 *power to ground through the tree in question, was the PG&E equipment*
 19 *then set to detect such an occurrence?*

20 On July 13, 2021, the line recloser at the Bucks Creek substation for the Bucks Creek
 21 1101 Line was set to open and de-energize the line if it detected either of two ground fault
 22 conditions: First, the line recloser would open and de-energize the line if it detected a ground fault
 23 with current of 50 amps or more that lasted for a pre-set length of time determined by the selected
 24 time characteristic curve ("TCC").⁷ Second, under the "Sensitive Earth Fault" setting, the line
 25 recloser would open and de-energize the line if it detected a ground fault that continuously remained
 26 at 20 amps or more for a period of 20 seconds. The line recloser also was set so that it would create

27 ⁷ Under the applicable TCC, the greater the current in excess of the MTT of 50 amps, the shorter
 28 the period of time required before the recloser would open and de-energize the line.

1 an event file, and would record the associated oscillography, if it detected a ground fault in excess of
 2 either the Minimum To Trip (“MTT”) of 50 amps or the MTT of 20 amps, irrespective of whether
 3 that event lasted long enough to cause the recloser to open and de-energize the line. *See* Ex. B,
 4 Recloser Witness 1 Decl. (Dkt. 1408-02) at 2:25-3:12; Ex. D, Recloser Witness 3 Decl. (Dkt. 1408-
 5 04) ¶¶ 4-10.

6 Throughout the day, the controller unit in the line recloser calculates a potential
 7 ground current based upon the manufacturer’s algorithms and the actual measurements of the current
 8 flowing on each of the three phases. Some level of potential ground current is consistent with
 9 normal operation of the line, and the level may vary based on circumstances particular to the line. If
 10 the calculated potential ground current meets either of the preset ground fault conditions just
 11 described, the line recloser will open and de-energize the line.

12 The potential ground current levels for the Buck’s Creek 1101 Line recorded in
 13 PG&E’s Process Information (“PI”) Historian database for July 13, 2021, are provided with this
 14 submission. *See* Ex. PP.⁸ That data shows that, on July 13, 2021, both before and after 6:48 a.m.,
 15 the calculated potential ground current ranged between 0 and 1.6 amps. *See id.*

16 **Question 13:**

17 *Is PG&E in possession of any information from any source that*
 18 *contradicts or supports the scenario that the tree on the line became a*
 19 *ground fault that conducted electricity from the live wire to ground? If so,*
 20 *state all such information in summary form and separately provide the*
 21 *back up.*

22 **PG&E Response:**

23 As described and evidenced in PG&E’s September 17, 2021 filing (Dkt. 1417), the
 24 line recloser at the Bucks Creek substation for the Bucks Creek 1101 Line did not open or create an
 25 event file for a ground fault on July 13, 2021. However, PG&E notes that at approximately 6:48

26 ⁸ Details regarding the manner in which the PG&E RT SCADA system acquires and records
 27 data from the line recloser is set forth in paragraph 4 of the August 31, 2021 Declaration of Recloser
 28 Witness 1 (Ex. CC, Dkt. 1444-05).

1 a.m. on July 13, 2021, the line recloser did record a line to line fault event and that both before and
 2 after 6:48 a.m. on July 13, 2021, the calculated potential ground current ranged between 0 and 1.6
 3 amps. This data is not inconsistent with the possibility that a ground fault drawing current below the
 4 MTT of 20 amps could have existed.

5 PG&E is not aware of any additional information in its possession not already
 6 submitted to the Court indicating whether the tree on the line became a ground fault that conducted
 7 electricity from the live wire to ground. CAL FIRE has not provided PG&E with access to or
 8 receipts for evidence that CAL FIRE has collected from the site, including the Douglas Fir and
 9 various PG&E equipment, and PG&E's investigation remains ongoing. For these reasons, PG&E is
 10 unable at this time to reach a conclusion as to what happened or foreclose alternative scenarios.

11 **Question 14:**

12 *Is PG&E in possession of any information from any source that*
 13 *contradicts or supports the scenario that the tree on the line became a*
 14 *ground fault that conducted electricity from the live wire to ground? If so,*
state all such information in summary form and separately provide the
back up.

15 **PG&E Response:**

16 PG&E refers the Court to its response to Question 13, above.

17 **Question 15:**

18 *Is PG&E in possession of any information from any source concerning the*
 19 *extent to which Douglas Firs conduct electricity? If so, state all such*
 20 *information in summary form and separately provide the back up.*

21 **PG&E Response:**

22 PG&E has not been able to identify any information in its possession specifically
 23 concerning the extent to which Douglas Firs conduct electricity.

24 **Question 16:**

25 *Is PG&E in possession of any information from any source that would*
 26 *indicate that the fire would have ignited anyway even if Bucks Creek 1101*
 27 *had been de-energized soon after the Troubleman arrived at Cresta Dam?*
 28 *If so, state all such information in summary form and separately provide*
the back up.

PG&E Response:

The time at which vegetative matter reached a temperature sufficient to cause ignition has not been determined. PG&E is not aware of any information in its possession indicating whether or not the fire would have ignited anyway even if Bucks Creek 1101 had been de-energized soon after the Troubleman arrived at Cresta Dam. PG&E's investigation into how and when the Dixie Fire started remains ongoing.

Question 17:

With respect to the declaration previously provided by the Senior Manager of the Distribution Planning Group:

- a. Explain the terms "phase fault," "ground fault," and "sensitive ground fault;"*
- b. What was the applicable MTT?*
- c. The measurement was less than 4/100ths of a second, but how much less?*
- d. What is a "phase to phase" fault?*
- e. With respect to the phase to phase fault detected by PG&E, what was the maximum amperage detected?*

PG&E Response:

PG&E provides below the additional information requested by the Court with respect to the July 28, 2021 declaration of Recloser Witness 1 (Ex. B, Dkt. 1408-02).

Parts (a)-(b): The terms "phase fault," "ground fault," and "sensitive ground fault" appear in the following paragraph of Recloser Witness 1's declaration:

In the setting operative on July 13, detection of any one of three different preset fault conditions could cause the line recloser to "trip"—that is, to open and de-energize the line. For each of these preset fault conditions, detection of current in excess of a "Minimum To Trip" ("MTT") amperage is a necessary condition to trip the line recloser. For a phase fault the MTT is 100 amps. For a ground fault the MTT is 50 amps. And for a sensitive ground fault the MTT is 20 amps.

Id. at 2-3. As used in this paragraph, (1) the term "phase fault" refers to the line recloser's measurement of current on a phase of the Bucks Creek 1101 Line in excess of the MTT selected in the controller's "phase" overcurrent protection settings, (2) the term "ground fault" refers to the line recloser's calculation of ground current in excess of the MTT selected in the controller's "ground"

overcurrent protection settings, and (3) the term “sensitive ground fault” refers to the line recloser’s calculation of ground current in excess of the MTT selected in the controller’s “Sensitive Earth Fault” settings. The MTT for such a “phase fault,” “ground fault” and “sensitive ground fault” are 100 amps, 50 amps, and 20 amps, respectively.

Parts (c)-(e): The term “phase to phase fault” appears in the following paragraph of the 7/28/21 Recloser Witness 1 Decl.:

The controller on the line recloser records various data, including oscillography data for events when a fault condition with amperage in excess of an applicable MTT is detected. The data downloaded from the line recloser includes just one such event on July 13, 2021. That event involved a phase to phase fault with amperage in excess of the applicable MTT on two of the three phases of the line. This event began at approximately 6:47:47 a.m., the event apparently lasted less than 4/100ths of a second and that was too brief to trip the line recloser.

Id. at 3 (footnote omitted). As used in this paragraph, the term “phase to phase fault” refers to current flowing between two phases of the Bucks Creek 1101 Line, as evidenced by the recorded oscillography. The event lasted approximately 0.0395 seconds (which is 5/10,000ths of a second less than 4/100ths of a second).⁹ The maximum amperage was approximately 726 amps on one phase and approximately 721 amps on the other phase.¹⁰

Question 18:

With respect to Attachment 1 to the Declaration of the Senior Manager of the Distribution Planning Group filed August 31, 2021:

a. What is the significance of the alternating pattern of entries (typically 1.2 v. 2.4)?

b. What, if anything, do the data tell us about a fault to ground possibility? What would the entries have looked like had all been normal?.

⁹ Compare Recloser Witness 3 Decl. (Ex. D, Dkt. 1408-04) ¶ 12 (screen shot of recorded oscillography reflecting phase to phase fault event began at approximately 22:57:18.4000 on July 12, 2021) *with id.* ¶ 15 (screen shot of recorded oscillography reflecting phase to phase fault event ended at approximately 22:57:18.4395 on July 12, 2021).

¹⁰ See Recloser Witness 3 Decl. (Ex. D, Dkt. 1408-04) ¶ 14 (screen shot of recorded oscillography reflecting phase B at 726.084 amps, and phase C at 721.424 amps, when phase to phase fault event at its maximum).

PG&E Response:

PG&E provides below the additional information requested by the Court with respect to Attachment 1 to the August 31, 2021 declaration of Recloser Witness 1 (Ex. CC, Dkt. 1444-05).

Part (a): Periodic increases and decreases in the load on a phase are normal and expected in electric distribution systems when one or more users connected to that phase use more or less power at different times of the day (e.g., by turning equipment on or off, or by having equipment perform work requiring greater or lesser electric energy).

Part (b): PG&E has two users on the Bucks Creek 1101 Line located load-side and downstream from Fuse 17733; namely, PG&E's Cresta Dam facility and the nearby Caltrans tunnel. PG&E's Electric Distribution GIS database indicates that each of these locations had three-phase transformers. Had these two locations not lost power after the 6:48 a.m. event, the loads on each phase recorded on Attachment 1 to Recloser Witness 1's August 31, 2021 declaration generally would be higher.

PG&E does not believe at present that the load data in Attachment 1 either establishes or precludes the possibility that a low-amperage high impedance phase to ground fault existed.

Question 19:

Please explain in your filing due September 24 all differences (and similarities) between Fast Trip Mitigation versus simply reducing the Minimum To Trip.

PG&E Response:

Reducing the Minimum to Trip ("MTT") threshold involves decreasing the threshold level of current that, when exceeded for a prescribed amount of time, will cause a protective device to open or "trip". For example, on July 13, 2021, the line recloser at the Bucks Creek substation for the Bucks Creek 1101 Line referenced in PG&E's September 17, 2021 responses to Questions 5 and 7, had two MTT thresholds with different amperages that, if exceeded for prescribed amounts of time, would have caused the line recloser to open. On that day, the line recloser was set to open if it detected (1) a phase fault of 100 amps or more ("100-amp MTT") that lasted for a pre-set length of

1 time determined by the selected time characteristic curve, which, as the recorded amperage of the
2 fault were to increase, would reduce the requisite amount of time needed to trip the line recloser and
3 de-energize the line, (2) a ground fault of 50 amps or more (“50-amp MTT”) that lasted for a pre-set
4 length of time determined by the selected time characteristic curve, or (3) a ground fault that
5 continuously remained at 20 amps or more (“20-amp MTT”) for a period of 20 seconds. Reducing
6 the MTT threshold, without also selecting a new time characteristic curve or time-period
7 requirement, would lower the current for the tripping threshold but would not otherwise be intended
8 to reduce the amount of time it would take a fault to trip the line recloser and de-energize the line.

9 Fast Trip Mitigation, on the other hand, involves both decreasing the MTT current
10 value and in trip setting (1)-(2) above, replacing the use of a time-characteristic curve for
11 determining the requisite length of time that a given current needs to exist before tripping the line
12 recloser with the use a single period of time—fractions of a second—that is independent of the
13 current value and, in trip setting (3) above typically reducing the requisite period of time. In effect,
14 PG&E expects Fast Trip Mitigation to decrease the period of time that the fault current typically
15 needs to exceed MTT in order to cause a protective device to operate.

Dated: September 24, 2021

Respectfully Submitted,

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Appendix 1

<u>Simplex Channel</u>	<u>Use Case</u>	<u>Transmit Frequency</u>	<u>Receive Frequency</u>
105	System-Wide	451.8000	451.8000
106	System-Wide	451.8125	451.8125
107	System-Wide	464.5000	464.5000
108	System-Wide	464.5500	464.5500
121	Specific Watersheds	451.0250	451.0250
122	Specific Watersheds	451.1750	451.1750
123	Specific Watersheds	451.2000	451.2000
124	Specific Watersheds	451.1500	451.1500
125	Specific Watersheds	451.1500	451.1500
142	System-Wide	461.0375	461.0375
143	System-Wide	461.0625	461.0625
144	System-Wide	461.0875	461.0875
145	System-Wide	461.1125	461.1125
146	System-Wide	461.1375	461.1375
147	System-Wide	461.1625	461.1625
148	System-Wide	461.1875	461.1875
149	System-Wide	461.2125	461.2125
150	System-Wide	461.2375	461.2375
151	System-Wide	461.2625	461.2625
152	System-Wide	461.2875	461.2875
153	System-Wide	461.3125	461.3125
154	System-Wide	461.3375	461.3375
155	System-Wide	461.3625	461.3625
156	System-Wide	464.4875	464.4875
157	System-Wide	464.5125	464.5125